

Sharing Apples

There are 6 apples and 2 friends. Each friend gets a fair share using all 6 apples. How many apples does each friend get? Show and tell how you know.

For further instruction, please see the related task, *Sharing Red Paper*, on page 335.

Sharing Apples

Task

There are 6 apples and 2 friends. Each friend gets a fair share using all 6 apples. How many apples does each friend get? Show and tell how you know.

Alternative Versions

More Accessible:

There are 4 apples and 2 friends. Each friend gets a fair share using all 4 apples. How many apples does each friend get? Show and tell how you know.

More Challenging:

There are seven apples and two friends. Each friend gets a fair share using all seven apples. How many apples does each friend get? Show and tell how you know.

NCTM Content Standards and Evidence

Instructional programs from pre-kindergarten through grade 12 should enable all students to —

- Use informal strategies to solve “fair-sharing” problems with collections of up to 10 items between two people
- In this task, learners must be able to divide six apples into two equal groups.

Links

This task would link well to snack time. Tasks about sharing arise regularly for young children, and a real-life connection can be made.

Support

A child can be given apples or manipulatives to represent/model the three apples per friend and can be encouraged to transfer her/his model to paper if s/he is comfortable doing so, or the teacher can take a picture of the child’s model. (Many children will select paper, pencil, crayon, etc. to show their solution.) A teacher, older student, paraprofessional, volunteer, etc. should scribe the child’s solution so the teacher will have a complete record of the child’s reasoning.

Task-Specific Assessment Notes

General Notes

Many children will solve this task by diagramming two friends and then assigning an apple to each friend in order until all six apples are distributed. Some children will be able to assign more than one apple at a time to each friend in diagramming a fair share for each friend.

Novice

The Novice will be unable to solve the task and could simply draw a “picture” of friends or apples. No understanding of the underlying mathematics of the task is evident.

Apprentice

The Apprentice will be able to partially solve the task. S/he will understand that the task involves two friends but might not be able to assign three apples to each friend. The Apprentice will attempt to communicate her/his reasoning by using a mathematical language term and/or number. The Apprentice will also attempt to make an appropriate representation. A connection may be attempted but it will not be mathematically relevant to the task.

Practitioner

The Practitioner will be able to correctly solve the task by assigning apples to each friend for a correct answer of three apples for each friend. Terms could include, but are not limited to, *diagram, total, fair share, 1, 2, 3...* The Practitioner will be able to construct an appropriate and accurate representation (usually a diagram but could also use a model or table). The Practitioner will make a mathematically relevant observation (connection about her/his solution) such as if there were three friends, each friend would have two apples.

Expert

All the Practitioner criteria are evident and the Expert will be able to demonstrate a deeper understanding of the mathematical concept of fair share or “half” in the task. The Expert will also bring more mathematical language and/or numbers to the task than the Practitioner. Terms could include, but are not limited to, *diagram, model, table, first, second..., even, pair, total, sum, equal, fair share, half, 1/2* and *equation*. The Expert will often use her/his representation to explore the underlying mathematical concepts in the task. The Expert could but, is not limited to, conclude that three apples is one half of six apples, that you can add a third friend and still have a fair share of whole apples but if you have four friends you will need to divide the last two apples differently. The Expert may construct a new representation to verify her/his answer or relate the “Sharing Apples” task to a similar task and state the mathematical similarities.

Rationales for Novice Work

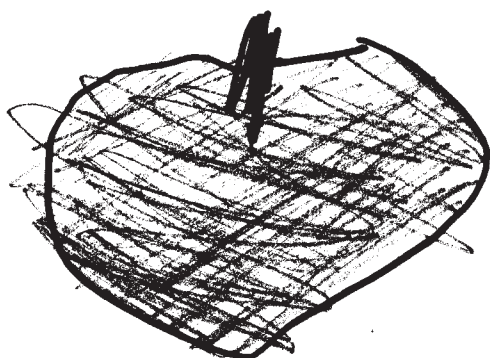
	Novice*
Problem Solving/ Reasoning/Proof	The child's drawing of one apple for a friend does not demonstrate an understanding of the mathematical concept of fair share. <i>(Novice)</i>
Communication	The child uses no mathematical terms or numbers to communicate her/his reasoning. <i>(Novice)</i>
Representation	The child's drawing of one apple for a friend is not appropriate and accurate to the task and does not support an understanding of fair share. <i>(Novice)</i>
Connections	The child is unable to make a mathematically relevant observation because s/he demonstrates no understanding that six apples need to be fairly shared between two friends. <i>(Novice)</i>

*Achievement Level

P/S R/P	Com	Rep	Con	Ach. Level
N	N	N	N	Novice

Exemplars

Novice



"This is an apple for my friend. (pointed correctly)."

(Task is reread.)

"He can only have that apple."

– Scribed by Teacher

Rationales for Apprentice Work

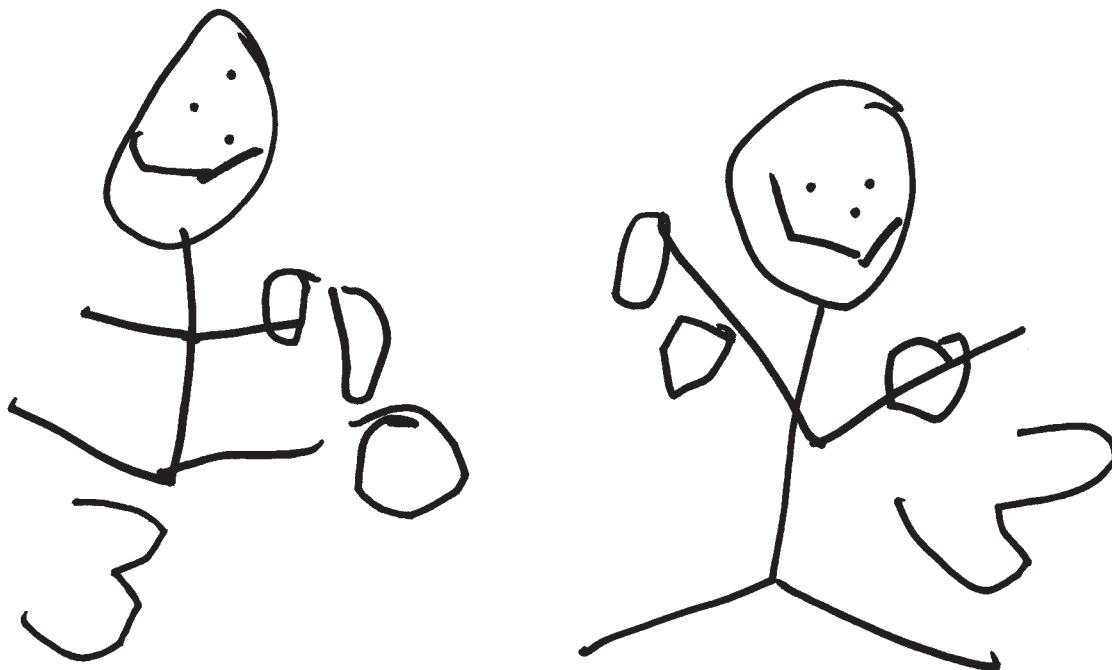
	Apprentice*
Problem Solving/ Reasoning/Proof	The child's strategy of making a diagram to represent three apples for each friend would work to solve the task. The child correctly states the answer, "They each get three." <i>(Practitioner)</i>
Communication	The child uses no mathematical terms but does correctly orally count from one to six for the apples. The child correctly notates the number three for each friend. <i>(Practitioner)</i>
Representation	The child's diagram is appropriate to the task but is not completely accurate. The child's scribing does not label the apples or each friend. You can assume that "one here" and "they each get three" are apples and friends for Problem Solving and Reasoning and Proof but not for the representation. All representations have to be clearly labeled on the work or in the scribing to earn a Practitioner Level. <i>(Apprentice)</i>
Connections	The child solved the task and did not make a mathematically relevant observation. <i>(Apprentice)</i>

*Achievement Level

P/S R/P	Com	Rep	Con	Ach. Level
P	P	A	A	Apprentice

Exemplars

Apprentice



"You got to put one here, one here until you get no more. They each get three."

(Child counted 1, 2, 3. 1, 2, 3. 1, 2, 3, 4, 5, 6.)

– Scribed by Teacher

Rationales for Practitioner Work

	Practitioner*
Problem Solving/ Reasoning/Proof	The child's strategy of making a diagram to show each friend having a fair share of three apples each would work to solve this task. The child correctly states the answer, "Three apples is a fair share for each friend." <i>(Practitioner)</i>
Communication	The child uses the mathematical term, <i>fair share</i> , and correctly counts one to six and one to nine as well as correctly notating one to six in her/his solution. <i>(Practitioner)</i>
Representation	The child's diagram of two friends each having three apples is appropriate and accurate. The scribing provides the necessary labels for the friends and apples. <i>(Practitioner)</i>
Connections	The child solves the task and then recreates the task by including her/himself to discover that nine apples are needed for three friends to have a fair share of three apples each. The child states, "You need nine apples for three friends to have three apples." <i>(Practitioner)</i>

*Achievement Level

P/S R/P	Com	Rep	Con	Ach. Level
P	P	P	P	Practitioner

Exemplars

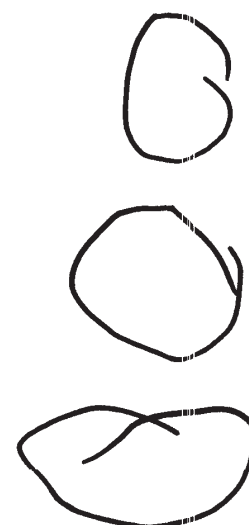
Practitioner



"These are apples for me."
(Child counted 1, 2, 3... 9 correctly.)

"You need nine apples for three friends to have three apples."

– Scribed by Teacher



"Three apples is a fair share for each friend."

"I made two friends. See, 1, 2. I made one apple, two apple, three apple... six apples. I stopped when I got to six apples."

– Scribed by Teacher

Rationales for Expert Work

	Expert*
Problem Solving/Reasoning/Proof	The child's strategy of making a diagram to represent two friends with three apples per friend would work to solve the task. The child's answer, "We each get three apples," is correct and the child's work supports this answer. The child uses her/his diagram to explore the mathematical concept of one half. The child decides to assign her/himself and "Grace" as the two "friends" in the task. This does not hinder the child's correct reasoning. (Expert)
Communication	The child uses the mathematical terms, <i>diagram</i> , <i>fair share</i> , <i>half/halves</i> , correctly. The child uses these terms to support their mathematical connection of finding halves. The child also correctly orally counts one to six for apples and then one to six and one to 12 for apple halves. The child also correctly notates the number three on her/his paper. (Expert)
Representation	The child's diagram of two friends with three apples each is appropriate and accurate. The scribing provides the necessary labels for the "me", "Grace" and apples. The child uses the diagram to reason that one whole apple is the same as two halves of an apple. (Expert)
Connections	The child demonstrates an understanding of one half and used this reasoning to support her/his statement, "I cut the apples in two pieces cause me and Grace like to eat them that way. That's still the same for each of us." The child also relates this task to a previous task "Snack Time" and states the similar mathematics in each. "This task is like "Snack Time" I shared six cookies like the six apples. It is three cookies and three apples for a fair share." (Expert)

*Achievement Level

P/S R/P	Com	Rep	Con	Ach. Level
E	E	E	E	Expert

Exemplars

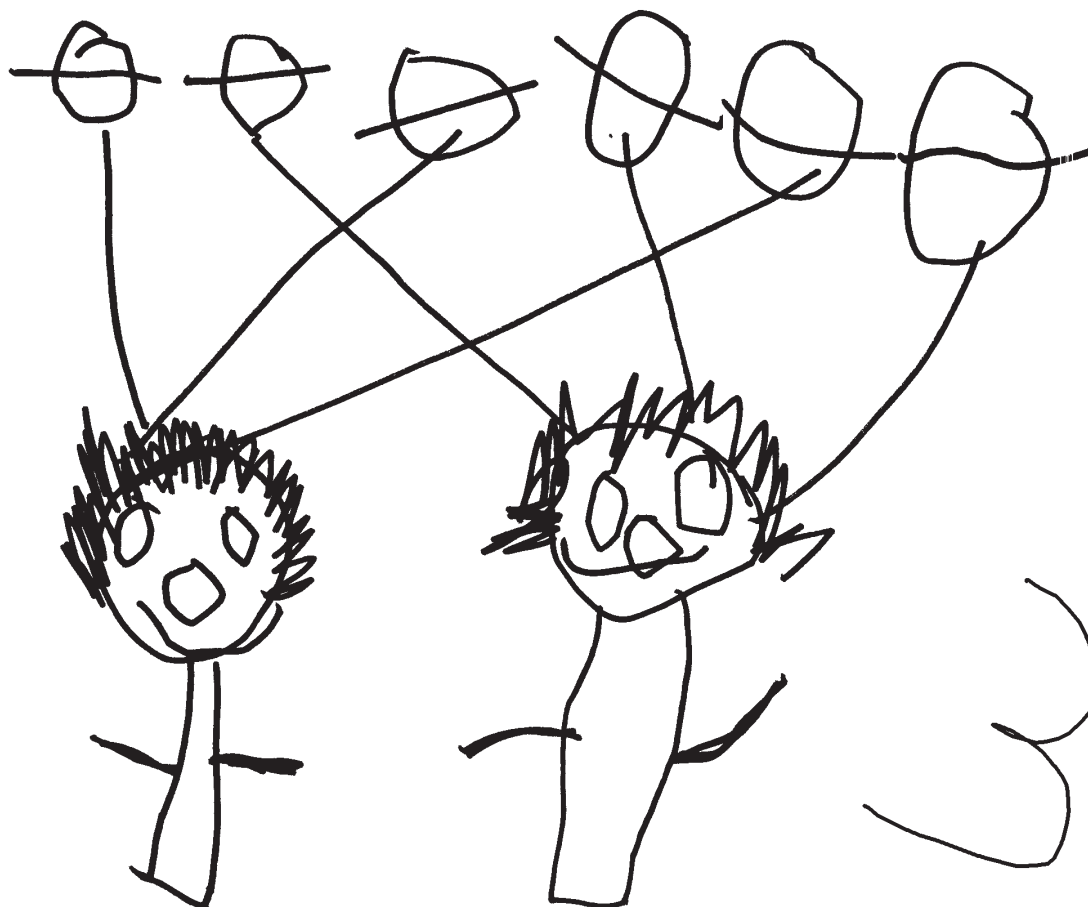
Expert

"This is my diagram. I'll tell you about it."

– Scribed by Teacher

(Child counted 1–6 correctly.)

– Scribed by Teacher



"This is me."

– Scribed by Teacher

"This is Grace."

– Scribed by Teacher

"We each get three apples. That's a fair share. I drew lines to me or Grace with my marker. I cut the apples in two pieces cause me and Grace like to eat them that way. That's still the same for each of us. (Child counted 1, 2, 3... 6 for each friend and then 1, 2, 3... 12 for total halves.) My mommy says that is half a apple. It is six halves for each of us."

"This problem is Snack Time! I shared six cookies like the six apples. It is three cookies and three apples for a fair share."

– Scribed by Teacher

Sharing Red Paper

There are 6 pieces of red paper and 2 friends. Each friend gets a fair share using all 6 pieces of red paper. How many pieces of red paper does each friend get? Show and tell how you know.

Related task for "Sharing Apples"